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10/762,495	01/22/2004	Malcolm G. Pettigrew	2003B004/2	5222

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EXAMINER

BOYER, RANDY

ART UNIT	PAPER NUMBER
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1764

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/762,495

Applicant(s)

PETTIGREW ET AL.

Examiner

Randy Boyer

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 March 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 7-15 and 76-79 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 76-79 is/are allowed.
- 6) ☒ Claim(s) 1-5, 7 and 10-14 is/are rejected.
- 7) ☒ Claim(s) 8, 9 and 15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Examiner acknowledges response filed 21 March 2007 containing amended claims 1-5, 7-9, and 14; new claims 76-79; and remarks.
2. The rejection of claims 4, 5, 7, 10, and 11-14 under 35 U.S.C. 103(a) are maintained. In addition, a new ground for rejection of claims 1-3 under 35 U.S.C. 102(a), and necessitated by Applicant's amendment, is entered. Finally, the previous rejection of claims 8, 9, and 15 under 35 U.S.C. 103(a) is withdrawn. Claims 76-79 are allowed. The rejections follow.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

4. Claims 1-3 are rejected under 35 U.S.C. 102(a) as being anticipated by Miller (US 6403854).
5. With respect to claim 1, Miller discloses a process for quenching a reactor effluent stream from an oxygenate to olefins reactor, the process comprising the steps

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of: (a) quenching the reactor effluent stream in a first quench stage with a first quench medium comprising an aqueous solution to form a first liquid fraction and a first effluent stream, wherein catalyst fines are washed from the reactor effluent stream into the first liquid fraction (see Miller, column 11, lines 56-67; and column 12, lines 1-2); (b) quenching the first effluent stream in a second quench stage with the first quench medium producing a second liquid fraction and a second effluent stream (see Miller, column 12, lines 21-26), wherein the second liquid fraction is cooled to form the first quench medium (see Miller, column 12, lines 14-18); (c) settling catalyst fines entrained in the first liquid fraction in a first settling vessel (see Miller, column 12, lines 1-4); and (d) removing at least a portion of the first liquid fraction from the first settling vessel (see Miller, column 12, lines 1-4).

6. With respect to claim 2, Miller discloses a first liquid fraction having no more than 20 wt% water and a majority of catalyst fines (see Miller, column 9, lines 4-10 and column 12, lines 1-2).

7. With respect to claim 3, Miller discloses wherein the second quench stage removes a majority of water based upon the amount of water in the reactor effluent stream (see Miller, column 12, lines 21-26).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been

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obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 4, 5, 7, 10, and 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miller (US 6403854) in view of Oleszko (US 3674890).

12. With respect to claim 4, Miller discloses a process for quenching a reactor effluent stream from an oxygenate to olefins reactor, the process comprising the steps of: (a) quenching the reactor effluent stream in a first quench stage with a first quench medium comprising an aqueous solution to form a first liquid fraction and a first effluent stream, wherein catalyst fines are washed from the reactor effluent stream into the first

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liquid fraction (see Miller, column 11, lines 56-67; and column 12, lines 1-2); (b) quenching the first effluent stream in a second quench stage with the first quench medium producing a second liquid fraction and a second effluent stream (see Miller, column 12, lines 21-26), wherein the second liquid fraction is cooled to form the first quench medium (see Miller, column 12, lines 14-18); (c) settling catalyst fines entrained in the first liquid fraction in a first settling vessel (see Miller, column 12, lines 1-4); and (d) removing at least a portion of the first liquid fraction from the first settling vessel (see Miller, column 12, lines 1-4).

Miller does not disclose wherein a third quench stage removes a majority of methanol based upon the amount of water in the effluent stream.

However, Oleszko discloses a process for the quenching of a cracked gas hydrocarbon stream through multiple quench zones in a single quench tower (see Oleszko, column 1, lines 10-24, and Figure 2). Oleszko explains that the process is effective in removing substantially all of the water that is formed as a byproduct in the upstream cracking operation as well as removing particulate carbon present in the cracked gas stream (see Oleszko, column 5, lines 16-20). Furthermore, Oleszko points out that the process is compatible for integration with other processes for the production of alkenes (olefins) and that it is advantageous because it requires little equipment (see Oleszko, column 1, lines 54-57).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the process of Miller so as to increase the

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number of quench stages thereby increasing the removal of water and methanol from the effluent stream of the oxygenate to olefin reactor.

13. With respect to claim 5, Miller discloses the removal of water and oxygenates (e.g. methanol) in a downstream quench stage (see Miller, columns 10 and 11).

14. With respect to claim 7, Miller discloses wherein the process further comprises the steps of: withdrawing the first effluent stream through the first passage (Fig. 3, line 62); separating, in the first settling vessel, a first portion of catalyst fines in the first liquid fraction from a partially clarified first liquid fraction, the partially clarified first liquid fraction comprising a second portion of the catalyst fines (see Miller, column 12, lines 1-2); withdrawing a first concentrated fines stream comprising the first portion of catalyst fines (see Miller, Fig. 3, line 65); and withdrawing the partially clarified first liquid fraction (see Miller, Fig. 3, lines 63 and 64).

15. With respect to claim 10, tubular quench fittings having a plurality of spray nozzles are known in the art. See e.g., Ngan (US 6626424).

16. With respect to claims 11-13, Oleszko discloses a second quench medium temperature that is 15°C lower than a first quench medium temperature (see Oleszko, column 5, lines 59-60 and 74-75).

17. With respect to claim 14, Miller discloses withdrawing a portion of the second liquid fraction from the first condensate outlet and directing it to the first quench inlet and second quench inlet (see Miller, Figures 2 and 3).

Allowable Subject Matter

18. Claims 8, 9, and 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

19. Claims 76-79 are allowed.

20. The following is Examiner's statement of reasons for allowance:

With respect to claims 8, 9, and 15, Examiner has reconsidered the previous rejection in view of the cited prior art and now finds these claims to be allowable. Specifically, Examiner notes that neither Miller nor Oleszko disclose or suggest the step of "withdrawing a second concentrated fines stream from [a] second settling vessel." Consequently, Examiner withdraws the previous rejection of claims 8, 9, and 15 made under 35 U.S.C. 103(a).

With respect to independent claim 76, neither Miller nor Oleszko disclose or suggest the steps of "(d) removing at least a portion of the first liquid fraction to a second settling vessel and forming a clarified aqueous liquid; and (e) removing the clarified aqueous liquid from the second settling vessel."

Response to Arguments

21. Applicant's arguments filed 14 March 2007 have been fully considered, but they are not persuasive.

22. Examiner understands Applicant's principal argument to be: Miller (US 6403854) does not cool a second liquid fraction that is produced in a second quench stage and

then use that second liquid fraction to quench the reactor effluent stream in the first quench stage.

23. Referring to Fig. 2 of Miller, a second liquid fraction is produced in a second quench stage (46) and withdrawn in line 28. The second liquid fraction is returned to the first quench stage (42) via lines 28 and 29 where it is used to quench the reactor effluent entering the first quench stage (42) in line 21. Because Miller does not provide a means for maintaining the temperature of the second liquid fraction in lines 28 and 29, some degree of cooling of the second liquid fraction via radiant heat transfer would be expected to occur in the time between when the liquid exits the second quench stage (46) and enters the first quench stage (42). Therefore, Miller provides for the return of a cooled second liquid fraction to the first quench stage (42) in order to quench the reactor effluent stream in the first quench stage (42).

24. Referring to Fig. 3 of Miller, a second liquid fraction is produced in a second quench stage (86) and withdrawn in line 69. The second liquid fraction is returned to the first quench stage (82) via lines 69, 70, and 67 where it is used to quench the reactor effluent entering the first quench stage (82) in line 61. In addition, Miller withdraws a first liquid fraction in line 63, and then cools a portion of it in intercooler 84. The cooled first liquid fraction in line 66 is then admixed with the second liquid fraction in line 70 to provide a quench stream (line 67) for the reactor effluent in the first quench stage (82). At the point of admixture, the cooled liquid in line 66 would be expected to decrease the temperature of the second liquid fraction in line 70, thereby providing a cooled second liquid fraction in line 67. Therefore, Miller provides for the return of a

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cooled second liquid fraction to the first quench stage (82) in order to quench the reactor effluent stream in the first quench stage (82).

Conclusion

25. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

26. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Randy Boyer whose telephone number is (571) 272-7113. The examiner can normally be reached Monday through Friday from 8:00 A.M. to 5:00 P.M.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola, can be reached at (571) 272-1444. The fax number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RPB



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